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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,114	11/06/2006	Dong Gyu Lee	05-499-B	5284
20306 7590 10/01/2009 MCDONNELL BOEHNNEN HULBERT & BERGHOFF LLP 300 S. WACKER DRIVE 32ND FLOOR CHICAGO, IL 60606				
EXAMINER ROGERS, LAKIYA G				
ART UNIT		PAPER NUMBER		
3744				
MAIL DATE		DELIVERY MODE		
10/01/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/570,114

Applicant(s)

LEE, DONG GYU

Examiner

LAKIYA ROGERS

Art Unit

3744

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the reply filed on 03/02/2009. Claim 1 has been amended and new claims 2-9 have been added.

Claim Objections

1. **Claim 3** is objected to because of the following informalities:

Claim 3 line 9 recites the limitation "the exterior". However there is insufficient antecedent basis for this limitation in the claim. For clarity, replace the word "the" with ---an--.

Claim 3 line 11 recites the limitation "the interior". However there is insufficient antecedent basis for this limitation in the claim. For clarity, replace the word "the" with ---an--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1 and 2** are rejected under 35 U.S.C. 103(a) as being unpatentable over Doke et al. (US 5315830) and Ghoshal (US 6474074).

Regarding claim 1, Doke teaches a compact thermal exchange device for thermo-electric cooling mode, the device comprising: a planar thermal electric cooling unit (32) having an upper planar side (upper side being the side on which fan 64 is located) and a lower planar side (lower side being the side on which fan 66 is located), comprising two planar plates wherein each of the planar plates (36 and 38) is positioned on the upper planar side and the lower planar side of the

unit, respectively (see Fig. 3), a plurality of fins (40 and 50; see Fig. 2), an external fan (64) provided over the fins; and an internal fan (66) provided under the fins.

Doke fails to explicitly teach a plurality of heat pipes, wherein each of the plurality of heat pipes is positioned within a corresponding one of the planar plates, coplanar to the corresponding one of the planar plates, wherein a predetermined portion of each of the plurality of heat pipes extends laterally beyond the corresponding one of the planar plates; and the plurality of fins formed on the predetermined portion of the heat pipes.

However, Ghoshal teaches in Fig. 7B the equivalent technique of providing a plurality of heat pipes (770,780) positioned within a planar plate (plate containing the TEC units and heat pipes) with a predetermined portion (780) of the heat pipes extending from the side of the plate beyond the side, with a plurality of fins (760) formed on the predetermined portion (780) of the heat pipes. Ghoshal implicitly teaches that this configuration is beneficial to have a heat pipe apparatus that is flexible so that it can be used in a plurality of different implementations (Col. 1, lines 39-44). A person of ordinary skill in the art at the time of invention would also recognize that the addition of a heat pipe assembly to a thermoelectric cooling system helps to handle peak loads along with overcoming losses during power off periods. A person of ordinary skill in the art at the time of invention would further recognize that the technique of Ghoshal is equivalent to the technique as claimed because they both implement a heat transfer assembly including a plurality of heat pipes and fins to aid a thermoelectric cooler in dissipating heat.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to modify the system of Doke to include a plurality of heat pipes wherein each of the plurality of heat pipes is positioned within a corresponding one of the planar plates wherein a

predetermined portion of each of the plurality of heat pipes extends laterally beyond the corresponding one of the planar plates; and the plurality of fins formed on the predetermined portion of the heat pipes in order to have a flexible device that is capable of handling peak loads and overcoming losses during power off periods in view of the teaching of Ghoshal.

Regarding the heat pipes being positioned coplanar to the corresponding planar plate, a person of ordinary skill in the art at the time of invention would recognize that maximizing surface contact area is vital in heat transfer apparatuses for achieving the greatest rate of heat transfer.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to further modify the system of Doke to position the heat pipes to be coplanar to the planar plate in order to maximize heat transfer rates in light of the level of ordinary skill in the art at the time of invention.

Regarding claim 2, Doke as modified teaches the invention as recited above but fails to explicitly teach that each of the plurality of heat pipes is positioned in the center of each of the planar plates.

However, it would have been obvious to a person of ordinary skill in the art at the time of invention to position the heat pipes in the center of each of the planar plates since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

4. **Claims 3-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Doke et al. (US 5315830) and Pokharna et al. (US 6415612).

Regarding claim 3, Doke teaches a compact thermal exchange device comprising: a thermal electric cooling unit (32) formed around a thermal exchange device (34), comprising a first planar plate (36) wherein the first planar plate is formed on a first plane and a second planar plate (38) wherein the second planar plate is formed on a second position positioned below the first plane; a first housing wall (22) positioned above the first plane (see Figs. 2 and 3); a second housing wall (90) positioned below the second plane; a first plurality of fins (40) and a second plurality of fins (50).

Doke fails to explicitly teach a first heat pipe positioned within the first planar plate and extending laterally into an exterior of the housing; a second heat pipe positioned within the second plate and extending laterally to an interior of the housing; the first plurality of fins formed on the first heat pipe, the plurality of fins extending radially from the first heat pipe; and a second plurality of fins formed on the second heat pipe, the second plurality of fins extending radially from the second heat pipe.

However, Pokharna teaches a thermoelectric cooling assembly in Fig. 2 having a first heat pipe (22) positioned within a first planar plate (20) a second heat pipe (23) positioned within a second planar plate (25) and extending from the side. First heat pipe (22) has a plurality of fins (24) extending radially from it as a remote heat exchanger. Pokharna further teaches that the heat pipe, heat exchanger and fan assembly transports heat without the need of power supply to the thermoelectric unit (Col. 3, lines 10-15). Therefore, it would have been obvious to a person of ordinary skill in the art to duplicate the heat exchanger and fan assembly shown in Fig. 2 at the side of block (20) on the other side of block (25) in order to provide additional reserve

cooling capacity when power is not being supplied to the thermoelectric unit in view of the teaching by Pokharna.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to modify the device of Doke to include a first heat pipe positioned within the first planar plate; and a second heat pipe positioned within the second plate and; a first plurality of fins formed on the first heat pipe, the plurality of fins extending radially from the first heat pipe; and a second plurality of fins formed on the second heat pipe, the second plurality of fins extending radially from the second heat pipe in order to be able to provide heat exchange when power is not being supplied to the thermoelectric unit in view of the teaching of the technique by Pokharna.

A person of ordinary skill in the art at the time of invention would also recognize that as modified, the first and second heat pipes would extend laterally into an interior and exterior of the housing (see Fig. 4 of Doke).

Regarding claims 4 and 5, Doke as modified teaches the invention as recited above and Doke further teaches in Figs. 1-3 comprising an external fan (64) formed on the upper side of the first plurality of fins (40) and that the external fan processes an outside air.

Regarding claims 6 and 7, Doke as modified teaches the invention as recited above and Doke further teaches in Figs. 1 and 2 an internal fan (66) formed on a lower side of the second plurality of fins (50) and that the internal fan processes the air within the housing wall.

5. **Claims 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Doke et al. (US 5315830) and Pokharna et al. (US 6415612) further in view of Chang et al. (US 6474407).

Regarding claims 8 and 9, Doke as modified teaches the invention as recited above but fails to explicitly teach that the first and second plurality of fins are high density fin stacks.

However, Chang teaches a composite heat sink with high density fins in Fig. 3. Chang further teaches that since the surface area has a major influence on the overall heat transfer, the heat sink is generally constructed to have a flat base with a plurality of flat fins; and in order to dissipate more heat a sink with a greater number of fins, which is referred to a high density fin heat sink, is developed (Col. 1, lines 25-31).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to further modify the device of Doke to include high density fins for the first and second plurality of fins in order to dissipate more heat in view of the teaching by Chang.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAKIYA ROGERS whose telephone number is (571)270-7145. The examiner can normally be reached on M-F: 8am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, please contact the examiner's supervisors, Cheryl Tyler (571)272-4834 or Frantz Jules can be reached on (571)272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. R. /
Examiner, Art Unit 3744

/Cheryl J. Tyler/
Supervisory Patent Examiner, Art Unit
3744